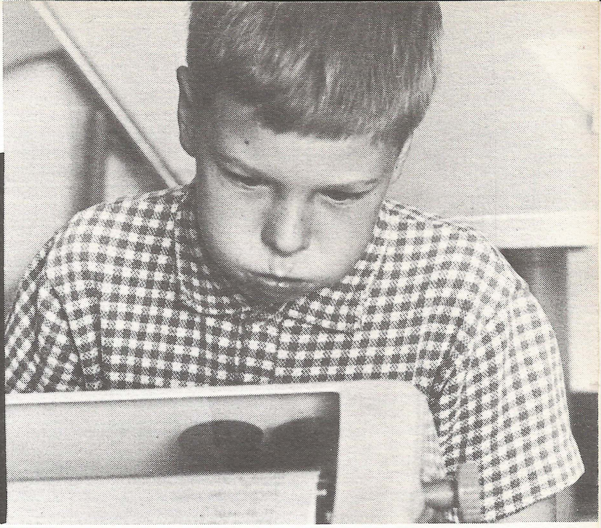
digital
146 Main Street
Maynard, Massachusetts 01754

edu

Number 4



2nd annual WIN A COMPUTER CONTEST

Hey Kids!?!

It's that time again! Another chance to win a computer for your school. And all you must do is follow these rules:

1. Prepare a graphic portrayal of *computers in the classroom.* This can be serious or humorous and illustrate any theme you wish. (See examples at end).
2. Prizes will be awarded in eight categories:

High School	Poster	Multi-color
High School	Poster	2-color
High School	Photography	Color
High School	Photography	Black + White
College	Poster	Multi-color
College	Poster	2-color
College	Photography	Color
College	Photography	Black + White

3. a. Posters may be done in any medium (poster paint, acrylic, oil, silk screen, magic marker, etc.) and may be any size. Two-color posters may be any one color on another color background, e.g., black on white, red on yellow, etc.
   b. Black and white photographs should be a minimum of 8″ x 10″ and may be larger. Captions or additional graphics are optional.
   c. Color photos may be 35 mm slides or color prints at least 8″ x 10″ in size. Captions or additional graphics are optional.
4. First prize in *each* of the eight categories will be 2 weeks of a Digital EduSystem installed at your school. In addition winners will receive a certificate and a $10 kinetic game; also their works will be displayed at 20 national and regional educational conferences and shows during the 1972–73 school year. Honorable mention winners will receive certificates and their works will be displayed in the Maynard minicomputer museum.
5. Deadline for entries: June 30, 1972.
6. All entries become the property of Digital Equipment Corporation to use in advertising or any other way. Entries cannot be returned.
7. Send all entries to:

   Educational Products Group (5–2)
   Digital Equipment Corporation
   Maynard, Massachusetts 01754

EXAMPLES

In your entry, you may use op art, pop art, realism, distortion, any other technique, and any theme. For example, "My Computer Understands Me," "Take a Computer to Lunch," "We Use Only, Genuine, Non-Polluting PDP8/E Computers." You may illustrate a computer bum, computer power or a PDP11/20 with extended forks and Collins #6 cams. You may show a terminal being used by David Cassidy, Ralph Nader, Raquel Welch, Big Bird or a member of your class. You can do a freaked out drawing of a DEC EduSystem in 2001 or an RSTS-11 System blowing someones mind (or its own mind). Let your imagination run wild. Innovate. Create. Have fun.

PROGRAM OF THE MONTH -AMAZIN

The program for this month was written by Jack Hauber of Loomis School in Windsor, Connecticut. And "AMAZIN" is just that! It prints out a different maze every time it is run AND it guarantees only one path through!! You only specify the size of the maze (width and length)—AMAZIN does the rest!

"AMAZIN" will run on EduSystem 20 (8K) with one user; the maximum maze size is 13 x 13.

```
RUN
WHAT ARE YOUR WIDTH AND LENGTH?
? 13,13


:--:--:--:--:--:--:--:--:--:  :--:--:--:
I           I              I     I     I
:--:--:--:  :  :  :--:--:  :  :  :  :  :
I        I  I  I     I     I  I  I  I  I
:  :--:  :  :  :--:  :  :--:  :--:  :  :
I     I     I  I  I  I     I  I     I  I
:  :--:  :  :  :  :  :  :  :  :  :--:  :
I  I     I  I  I  I  I  I  I        I  I
:  :  :--:--:  :  :  :--:  :  :--:--:  :
I  I        I     I     I  I        I  I
:  :--:  :  :  :--:--:  :  :--:--:  :  :
I     I  I  I  I     I  I        I  I  I
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I     I  I     I  I     I           I  I
:  :--:  :--:  :  :--:--:--:--:--:--:  :
I  I     I     I                    I  I
:  :--:--:  :--:--:--:--:--:--:--:  :  :
I  I     I        I     I     I     I  I
:  :  :  :--:--:  :  :--:  :--:  :  :  :
I     I  I        I     I        I  I  I
:--:--:--:  :--:--:  :  :  :--:--:  :  :
I           I        I  I  I     I  I  I
:  :--:--:--:  :--:--:  :--:  :  :  :--:
I     I     I        I  I     I  I     I
:  :  :  :  :--:--:  :  :  :  :  :--:  :
I  I     I           I     I  I        I
:--:--:--:--:--:--:--:--:--:  :--:--:--:
```

```
100 RANDOMIZE
110 DIM W(25,103),V(25,103)
120 PRINT "WHAT ARE YOUR WIDTH AND LENGTH?"
121 INPUT H,V
122 PRINT
130 IF H<>1 THEN 150
131 IF V<>1 THEN 150
132 PRINT "MEANINGLESS DIMENSIONS, TRY AGAIN"
140 PRINT
141 GO TO 120
150 PRINT
151 PRINT
160 LET Q=0
161 LET Z=0
162 LET X=INT(RND(0)*H+1)
163 FOR I=1 TO H
170 IF I=X THEN 173
171 PRINT ":--";
172 GO TO 180
173 PRINT ":  ";
180 NEXT I
190 PRINT":"
191 LET C=1
192 LET W(X,1)=C
193 LET C=C+1
200 LET R=X
201 LET S=1
202 GO TO 260
210 IF R<>H THEN 240
211 IF S<>V THEN 230
220 LET R=1
221 LET S=1
222 GO TO 250
230 LET R=1
231 LET S=S+1
232 GO TO 250
240 LET R=R+1
250 IF W(R,S)=0 THEN 210
260 IF R-1=0 THEN 530
261 IF W(R-1,S)<>0 THEN 530
270 IF S-1=0 THEN 390
280 IF W(R,S-1)<>0 THEN 390
290 IF R=H THEN 330
300 IF W(R+1,S)<>0 THEN 330
310 LET X=INT(RND(0)*3+1)
320 IF X=1 THEN 790
321 IF X=2 THEN 820
323 IF X=3 THEN 860
330 IF S<>V THEN 340
331 IF Z=1 THEN 370
332 LET Q=1
333 GO TO 350
340 IF W(R,S+1)<>0 THEN 370
350 LET X=INT(RND(0)*3+1)
360 IF X=1 THEN 790
361 IF X=2 THEN 820
362 IF X=3 THEN 910
370 LET X=INT(RND(0)*2+1)
380 IF X=1 THEN 790
381 IF X=2 THEN 820
390 IF R=H THEN 470
400 IF W(R+1,S)<>0 THEN 470
401 IF S<>V THEN 420
410 IF Z=1 THEN 450
411 LET Q=1
412 GO TO 430
420 IF W(R,S+1)<>0 THEN 450
430 LET X=INT(RND(0)*3+1)
440 IF X=1 THEN 790
441 IF X=2 THEN 860
442 IF X=3 THEN 910
450 LET X=INT(RND(0)*2+1)
460 IF X=1 THEN 790
461 IF X=2 THEN 860
```

```
470 IF S<>V THEN 490
480 IF Z=1 THEN 520
481 LET Q=1
482 GO TO 500
490 IF W(R,S+1)<>0 THEN 520
500 LET X=INT(RND(0)*2+1)
510 IF X=1 THEN 790
511 IF X=2 THEN 910
520 GO TO 790
530 IF S-1=0 THEN 670
540 IF W(R,S-1)<>0 THEN 670
541 IF R=H THEN 610
542 IF W(R+1,S)<>0 THEN 610
550 IF S<>V THEN 560
551 IF Z=1 THEN 590
552 LET Q=1
553 GO TO 570
560 IF W(R,S+1)<>0 THEN 590
570 LET X=INT(RND(0)*3+1)
580 IF X=1 THEN 820
581 IF X=2 THEN 860
582 IF X=3 THEN 910
590 LET X=INT(RND(0)*2+1)
600 IF X=1 THEN 820
601 IF X=2 THEN 860
610 IF S<>V THEN 630
620 IF Z=1 THEN 660
621 LET Q=1
622 GO TO 640
630 IF W(R,S+1)<>0 THEN 660
640 LET X=INT(RND(0)*2+1)
650 IF X=1 THEN 820
651 IF X=2 THEN 910
660 GO TO 820
670 IF R=H THEN 740
680 IF W(R+1,S)<>0 THEN 740
681 IF S<>V THEN 700
690 IF Z=1 THEN 730
691 LET Q=1
692 GO TO 830
700 IF W(R,S+1)<>0 THEN 730
710 LET X=INT(RND(0)*2+1)
720 IF X=1 THEN 860
721 IF X=2 THEN 910
730 GO TO 860
740 IF S<>V THEN 760
750 IF Z=1 THEN 780
751 LET Q=1
752 GO TO 770
760 IF W(R,S+1)<>0 THEN 780
770 GO TO 910
780 GO TO 1000
790 LET W(R-1,S)=C
800 LET C=C+1
801 LET V(R-1,S)=2
802 LET R=R-1
810 IF C=H*V+1 THEN 1010
811 LET Q=0
```

```
 812 GO TO 260
 820 LET W(R,S-1)=C
 830 LET C=C+1
 840 LET V(R,S-1)=1
 841 LET S=S-1
 842 IF C=H*V+1 THEN 1010
 850 LET Q=0
 851 GO TO 260
 860 LET W(R+1,S)=C
 870 LET C=C+1
 871 IF V(R,S)=0 THEN 880
 872 LET V(R,S)=3
 873 GO TO 890
 880 LET V(R,S)=2
 890 LET R=R+1
 900 IF C=H*V+1 THEN 1010
 902 GO TO 530
 910 IF Q=1 THEN 960
 920 LET W(R,S+1)=C
 921 LET C=C+1
 922 IF V(R,S)=0 THEN 940
 930 LET V(R,S)=3
 931 GO TO 950
 940 LET V(R,S)=1
 950 LET S=S+1
 951 IF C=H*V+1 THEN 1010
 952 GO TO 260
 960 LET Z=1
 970 IF V(R,S)=0 THEN 980
 971 LET V(R,S)=3
 972 LET Q=0
 973 GO TO 1000
 980 LET V(R,S)=1
 981 LET Q=0
 982 LET R=1
 990 LET S=1
 991 GO TO 250
1000 GO TO 210
1010 FOR J=1 TO V
1011 PRINT"I";
1012 FOR I=1 TO H
1013 IF V(I,J)<2 THEN 1030
1020 PRINT"   ";
1021 GO TO 1040
1030 PRINT"  I";
1040 NEXT I
1041 PRINT
1043 FOR I=1 TO H
1045 IF V(I,J)=0 THEN 1060
1050 IF V(I,J)=2 THEN 1060
1051 PRINT":  ";
1052 GO TO 1070
1060 PRINT ":--";
1070 NEXT I
1071 PRINT":"
1072 NEXT J
1073 END
```

ANNOUNCING....
EDUSYSTEM 25

At last, it's here!
The hottest item to appear on the Edu-scene since the birth of EduSystems themselves. EDUSYSTEM 25!

The newest of the Intermediate Systems is based on the proven, reliable PDP8/E processor, with 12K (24,000 bytes) of core memory and DECtape, too. EduSystem 25 is a core resident timesharing system that supports up to 8 student users simultaneously!

Sounds like EduSystem 20?

The superiority of EduSystem 25 unfolds with the extended features of EduSystem 25's BASIC language. It contains all the same goodies that EduSystem 20 has, and more:

EduSystem 25 has PROGRAM STORAGE!

The addition of DECtape provides temporary or permanent program storage capabilities to all 8 users.

EduSystem 25 has DATA FILE STORAGE!

Students can build their own data files on DECtape and retrieve that data at a future time. And teachers can create common data files that can be used to test student programs!

EduSystem 25 has STRINGS!

Six character EduSystem 50—like Strings! Students can input, manipulate and output alphanumeric strings, six characters at a time.

EduSystem 25 has CHAINING!

Students can write longer programs (up to 10,000 lines!) using the BASIC "CHAIN" command. Without it, maximum program length is 250 lines.

EduSystem 25 has MULTIPLE STATEMENTS PER LINE!

Bigger programs can be written without chaining, using the multiple statements per line capability. More than one BASIC statement can be written in one line which means *more* program without more memory!

EduSystem 25 BASIC is EduSystem 20 BASIC with the following additions: OLD, NEW, CATALOG, UNSAVE, SAVE, INPUT A$, PRINT A$, IF A$='String' THEN____, LET A$='String' CHAIN, FILE name, GET list, PUT list, and CLOSE.

But EduSystem 25 offers more than this powerful multi-user BASIC! Your students can use FOCAL, FORTRAN, and Assembly Language, too! Imagine!

If you have an EduSystem 20 today and you'd love to grow to an EduSystem 25...*all* you need is an additional 4K of memory and DECtape. And EduSystem 25 software, of course.

To expand from EduSystem 25 to EduSystem 40 requires only an optical mark card reader. And then EduSystem 50 is only an RF/RS08 disk away!

EDUSYSTEM 25 CONFIGURATION

Qty.	Number	Description	Price	Monthly Maint.
BASIC SYSTEM				
1	PDP8/E-CA	Computer, 4K Memory	$5,640	$50
1	MC8-E	First Add'l 4K Memory	2,750	20
1	MM8-E	Add'l 4K Memory	2,500	20
1	KP8-E	Powerfail Restart	250	2
1	MI8-EF	Edu Bootstrap	500	5
1	TC08	DECtape Control	4,500	20
1	TU56	Dual DECtape Drive	4,700	30
1	KD8-E	Data Break	500	3
1	KA8-E	Positive Bus	250	3
1	LT33-DC	Console TTY	1,500	30
1	EDU8-B25	System Software	250	—
1	EDU8-A	Textbook Kit	100	—

	Total System Price	Monthly Lease	Monthly Maint.
Single User System	$23,440	$516	$183
Four User System	28,840	635	288
Eight User System	38,540	848	448

1,000,000 STUDENTS

That's right! One million students use DEC computers every year! And we've just published a 30-page brochure that tells you all about them.

Like our other literature, the *1,000,000 Students* Referral Brochure contains lots of goodies for everyone. It's all about EduSystems in the Education world.

Maybe we've described the projects that are going on at your school. Maybe we've captured you with our candid camera! If you're a high school teacher or administrator (public or private), *1,000,000 Students* will bring you up to date on the latest happenings in high schools all over the country. It describes the ways that you are using EduSystems in the classroom. And it also contains a list of the high school EduSystem Users. (Knowing the schools in your area might give you a start toward exchanging ideas, maybe even forming a Local Users Group!)

If you're a college or university, vocational or technical school, junior or community college or involved in research, we've written a lot of the same about you.

You can request your copy today by writing to the Educational Products Group, DEC (5-2), 146 Main Street, Maynard, Massachusetts 01754. In the meantime, while you wait, here's an excerpt from the Referral Brochure. A capsulized summary of the many varied DEC Systems that are being used in schools...by a million kids a year!

⟶

Configuration	Typical Price	Software	Used to Teach	No. of Students
1. EduSystem 5 (Supercalculator) PDP8/ F, 4K, Teletype	$ 6,000	BASIC FOCAL	Problem Solving	50–70
2. EduSystem 10 (1-user) PDP8/E, 4K memory Teletype	7,000	BASIC FOCAL	Problem Solving Simulations Computer Architecture	50–70
3. EduSystem 20 (1–8 users) PDP8/E, 8K memory Up to 8 terminals	15,000 (4 users)	BASIC FOCAL	Problem Solving Simulations	up to 560
4. EduSystem 30 (Fast-batch) PDP8/E, 4K memory Disk or DECtape Optical Card Reader Teletype or DECwriter	19,000	BASIC (batch + interactive)	Problem Solving	400–800
5. EduSystem 30—PS/8 PDP8/E, 8K memory 2 DECtapes of Disks Teletype	17,000	BASIC FOCAL FORTRAN Assembly	Problem Solving Simulations Operating Systems	50-70
6. EduSystem 40 (Combines 3, 4, and 5)	29,000		(Combines 3, 4, and 5)	up to 800
7. EduSystem 50 (TSS/8) PDP8/E, 16K memory 262K Disk DECtape Up to 16 terminals	54,000 (8 users) 86,000 (16 users)	BASIC FOCAL FORTRAN ALGOL Assembly	Problem Solving Simulations Operating Systems Computer Science	up to 1100
8. EduSystem 60 PDP11/20, 4K memory Teletype	10,800	BASIC Assembly	Problem Solving Simulations Computer Architecture	50–70
9. EduSystem 70 PDP11/20, 16K memory Up to 8 terminals	40,000 (8 users)	BASIC	Problem Solving Simulations	up to 560
10. EduSystem 80 (RSTS-11) PDP11/20, 28K memory 262K Disk DECtape Up to 16 terminals	88,000 (16 users)	BASIC-PLUS FORTRAN IV	Problem Solving Simulations Operating Systems	up to 1100
11. LAB8/E PDP8/E, 8K memory Point Plot Display A/D, D/A Converters Teletype	13,000	BASIC FOCAL	Interfacing Real-time Systems	50–70
12. PDP/12 Display A/D, D/A Converters Terminal	30,000	BASIC FOCAL LINC Assembly	Problem Solving Simulations Real-time Systems Interfacing	50–70
13. Computer lab	375	—	Logic Design	10
14. Logic Design System PDP8/E, 4K memory I/O Access Panel Student Logic Circuit Kit(s) Terminal	10,000	BASIC FOCAL Assembly	Interfacing Logic Design Computer Architecture Real-time Systems	50–250*
15. Computer/Computer Lab System PDP8/E, 4K memory Computer Lab(s) 8/E—Computer Lab Interface	7,500	BASIC FOCAL Assembly	Logic Design Computer Architecture Real-time Systems	50–250*
16. PDP/15	100,000	FORTRAN IV	Information Systems Real-time Systems	up to 800
17. DECsystem 10 Simultaneous timesharing batch and real-time system	500,000	BASIC FORTRAN IV COBOL ALGOL TECO SNOBOL LISP Assembly	Problem Solving Simulations Operating Systems Real-time Systems Computer Architecture Computer Science	2000 +

DEC also manufactures a full complement of logic laboratory equipment, modules, peripherals, and custom hardware and software products, many specifically designed for educational users.

*Upper number of students served required additional Logic Circuit Kits ($100) or Computer Labs ($350) in quantity greater than one.

MINI-RSTS

BASIC-PLUS, a powerful version of the popular BASIC language, is now available on an economical version of the PDP-11 Resource Time Sharing System known as MINI-RSTS.

MINI-RSTS is based on a 1.2 million word moving head (removable) cartridge disk and a PDP-11/20 processor with 24,000 words (48,000 bytes) of core storage. The price for an 8-user system, not including terminals is under $45,000.

MINI-RSTS is the first computer system to integrate all system resources, including peripheral devices, into a single timesharing language, BASIC-PLUS, which gives each of up to eight users complete access to all system facilities.

BASIC-PLUS is compatible with standard Dartmouth BASIC, but has a unique set of language extensions for advanced programming work. It is an ideal language for beginning computer users because it is easy to learn and easy to remember. The language's direct, or calculator, mode allows even non-programmers to perform complex calculations. Explicit, line-by-line diagnostics point out mistakes immediately.

BASIC-PLUS includes features such as:

Powerful String Capabilities
- any length string may be manipulated using 12 distinct commands.

Matrix Operations
- entire arrays processed by a single command.

Output Formatting
- precise printing format may be specified. Ideal for administrative data processing.

System-level Error Handling
- available from within a BASIC-PLUS program.

Resource Sharing
- each user has system hardware and peripherals at his fingertips.
- each user has access to up to 16,000 bytes of memory (chaining capability extends this even further.)

Random and Serial Disk File Access
- user can access unlimited number of user disk files.

Multi-device Capability
- user can open and use the line printer, card reader and paper tape reader/punch for short bursts or permanent assignment.

MINI-RSTS will support up to 8 users. By expanding to 28,000 words of memory, the system will support peripheral devices such as the line printer, high speed paper tape reader/punch, card reader, and up to four RK03 removable cartridge disks. The system can also be expanded to the standard RSTS-11 system (which supports up to 16 users) by adding a fixed-head disk and DECtape.

GAMES COMPUTER BUMS PLAY

The Edu-Games for this month are "Games For Thinkers." WFF 'N PROOF publishers produced a series of excellent games for use in and out of the classroom. While they're fun and challenging to play, these games are also highly educational. They're the ones that have been known to raise non-verbal I.Q. scores by more than 20 points after just three weeks of use. They're the games that kids are playing in tournaments all over the country. Maybe you've heard of some of them:

WFF 'N PROOF: *The Game of Modern Logic*

The original game of symbolic logic; twenty-one game kit provides entertainment and practice in abstract thinking; relevant for philosophy, math, computer programming, and English (2–4 players).

QUERIES 'N THEORIES: *The Game of Science and Language*

Through inductive reasoning, players learn scientific inquiry and gain skill in organizing, analyzing and synthesizing data in an intriguing game of linguistics (2–4 players).

EQUATIONS: *The Game of Creative Mathematics*

Practice in arithmetic operations and numbering systems (2–4 players).

CONFIGURATIONS: *Number Puzzles and Patterns*

A series of ingenious geometric and mathematical problems (1 player).

QWIK-SANE

Intriguing topological puzzle (1 player).

ON-SETS:
The Game of Set Theory (2–4 players).

For more information, write to:

WFF 'N PROOF
1111 Maple Avenue
Turtle Creek, Pennsylvania 15145

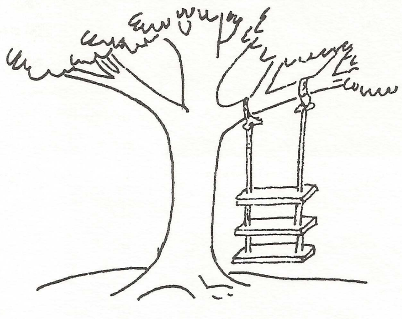
MINI-MARKET BOOM

Between July, 1970 and July, 1971, the total number of computers installed in the United States grew by 11.5%. This growth, *Computer Decisions* reports, took place almost entirely within the mini-computer market. The 41% growth within the mini market says something. These figures were obtained from an annual survey of computer population, taken by the Diebold Group, Inc. They show DEC as one of those firms who experienced significant increases in installations.

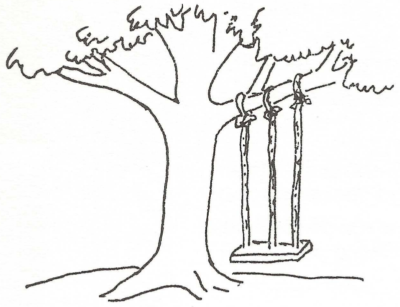
If you have an EduSystem today, or are buying one for your school soon, you're in good company!

THE ROOT OF THE PROBLEM

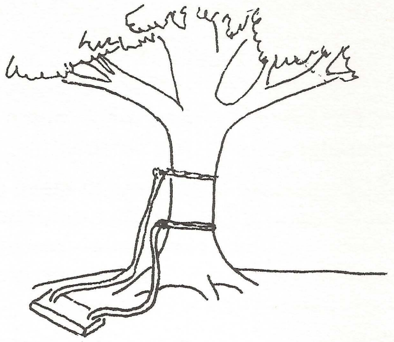
At DEC we have a way of communicating so that this doesn't happen!



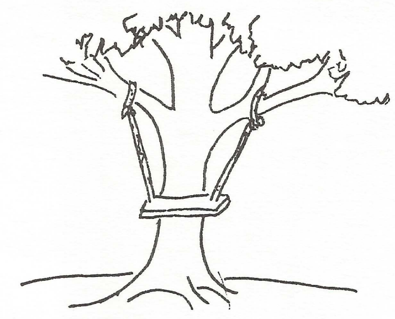
How Marketing Requested It...



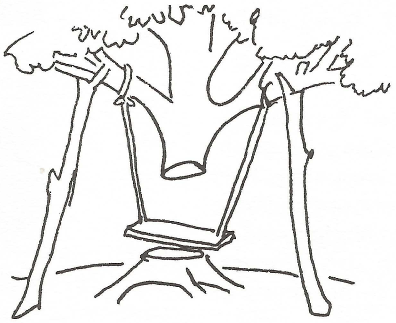
How Sales Ordered It...



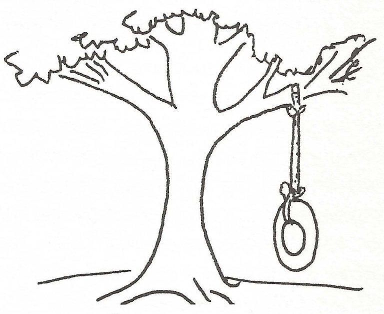
How Engineering Designed It...



How Manufacturing Made It...



How The Plant Installed It...



How The Customer Ordered It...

36-24-36

A number is PERFECT when the sum of its divisors (excluding itself) totals that number. For example, 6 is a perfect number (3+2+1=6), and 28 is a perfect number (1+2+4+7+14=28).

Until recently, only 20 of these perfect numbers were known. That is, until Roy Ferguson, 18, of Dallas, Texas, solved the problem with a FORTRAN program less than 25 lines long!

Finding the twenty-first perfect number took 1,000 hours on a Brand X computer. But using the PDP-10 at Southern Methodist University, Roy calculated the 22nd and 23rd perfect numbers in less than 3 hours! And the numbers contained 5,985 and 7,723 digits respectively!!!

How did he do it? "Datamation," November 15, 1970, reported, "Ferguson's approach to these problems in theoretical math bypassed the traditional method of starting with a large number as a single quantity. Instead, he considered the wanted number to consist of segments of modules of smaller numbers that aggregated a large number.

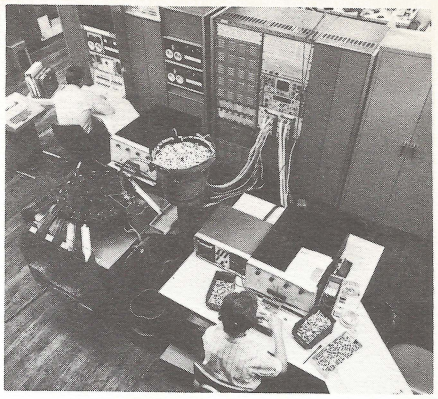
Needed was a technique for extended accuracy. The ordinary computer is accurate up to 6 or 8 digits. Ferguson needed to assure computer accuracy up to thousands of digits. He took the existing equation for perfect numbers and expanded it to write his program. In doing that, he also proved deductively the validity of what he believes is an original theory. The known equation is $(2^N-1\ (2^N-1)$. Marsenne Primes are precalculated values. In the above, they are represented by N. Ferguson's Theorem holds that the sum of all integers from 1 to 2^N-1 equals the perfect number. It may also be expressed $\sum^{N} (2^N-1)(2^N-1)(2^N-1)$.

This provides an alternative method of identifying perfect numbers. The application of this method is regarded by some mathematicians as of greater significance than the actual identifying of the perfect numbers, because it provides a method for obtaining accuracy with large numbers."

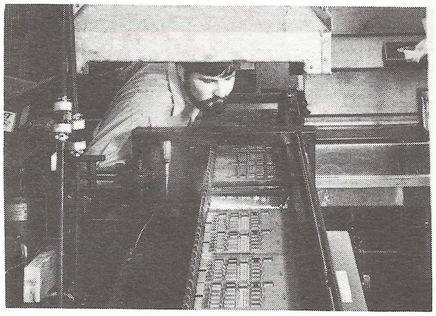
THE MAKING OF AN EDUSYSTEM

Did you ever wonder what goes on behind the scenes at DEC? About what goes into every EduSystem before it is installed in a school? This is the story of the PDP8/E processor and the procedure involved in "the Making of an EduSystem"—from bare metal to an instructional computer system—in a nutshell!

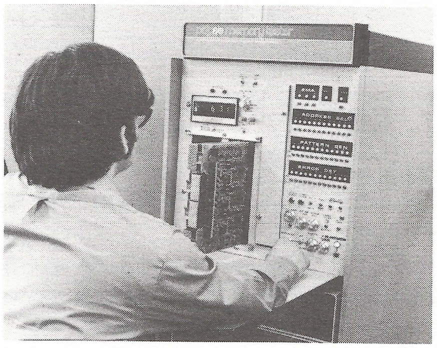
At DEC we *use* computers to make computers! Throughout every phase of design, production and assembly, our small computers play a vital role in assuring that at the heart of each new EduSystem is a reliable and thoroughly tested PDP8/E.



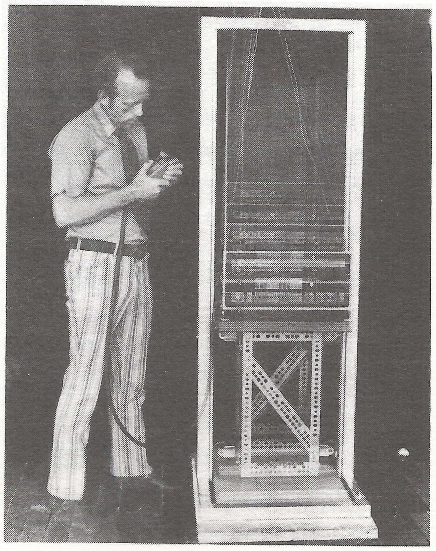
As each component arrives at the plant, it goes through dynamic computerized testing procedures. Because computers can perform the same task over and over again, tirelessly, accurately, and without variation, this method of testing increases the reliability of every new PDP8/E. Here, incoming integrated circuits are being tested before going into the assembly phase.



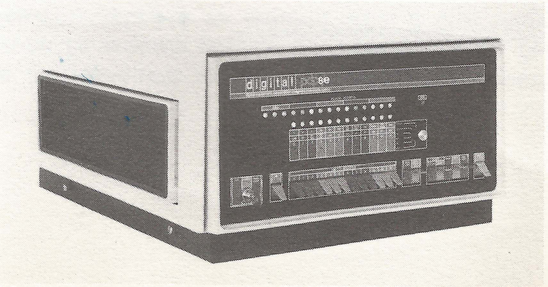
At DEC we take pride in being the world's largest manufacturer of logic modules. The many stages of module assembly take place in a large manufacturing area. This photo shows the module solder bath, where the logic modules are passed over a flowing band of molten solder. Over 1,000 modules a day pass through this process. Each board is later exercised and tested by hundreds of repetitive computerized tests.



Because PDP8's are used to produce new PDP8's, no "marginal" computers ever pass through the testing phase unnoticed. At the right, the PDP8/E core memory is undergoing extensive tests which include the varying of voltages and currents based on predetermined upper and lower limits.



All along the way to the finish line, through most phases of assembly, each part of the PDP8/E is tested and qualified. Only after this rigorous testing procedure has been completed are all the pieces of the processor assembled to make a *complete* PDP8/E. The assembled computer then undergoes a series of acceptance tests which include baking, freezing, and shaking of the unit. The processor is vibrated at 70 cycles/sec. for several minutes. It is also baked for 100 hours at 131°F. temperatures, and quickly frozen at 32°F. These tests are administered to assure the reliability of the processor under the stress of extreme environmental conditions. Here is pictured the famous "DROP TEST." Each PDP8/E is dropped three feet at a force of 20G to test the effect of rough handling.



After a series of evaluations from Product Test Groups, Quality Assurance and Field Service, the processor is finally ready to be mounted into a cabinet. In its totally assembled state, it goes through final testing procedures.

THE BOOK CROOK

It's a steal!
Loads of instructional materials and texts at practically no cost!

From Kiewit Computation Center at Dartmouth College and from the University of Denver come the curriculum materials outlined here.

DARTMOUTH MATERIALS
COLLEGE TEXTS:

	Price
BASIC Fifth Edition	$3.00
BASIC Primer	.50
Teaching Supplement #1: Number Theory	1.50
Teaching Supplement #2: Elementary Statistics	1.50
Teaching Supplement #3: Statistics	1.50
Teaching Supplement #4: Logic	1.50
Teaching Supplement #5: Linear Algebra	1.50
Catalog of Library Programs	2.00

SECONDARY SCHOOL TEXTS:

School BASIC by Kenneth Weissman

A beginning text designed for Junior High and High School students, Covers most items in the BASIC language with Sample problems and BASIC programming solutions. Provides an appendix of suggested problems for student programs.

BASIC in Ten Minutes a Day by Louis Hoitsma

A series of twelve short lessons which introduce BASIC to students without requiring extensive class time. Each lesson includes optional programming assignments. This text is designed to incorporate "hands on" experience with the BASIC lessons.

Computer Use in a General Math Course
by Ann Waterhouse

A four-part course for students which guides them through teletype usage, flow-charting, studies of factors, primes and multiples, simulations and games, and truth sets of equalities and inequalities. Each part includes Assignment Problems with flowchart and BASIC programming solutions.

A Computer Course for Business Students
by Ann Waterhouse

An eight to ten week course for business students. Text is designed to teach the BASIC language and computer programming using business-oriented problems.

Data Reduction Programs for Introductory Physical Science by Walter Congdon

A course for eighth and ninth grade students based on the introductory study of math. Text contains nine lab experiments, BASIC programs for computer analysis and program output listings. Designed for use in conjunction with post-lab discussion and analysis.

Orbital Mechanics by Joel Dalton

Three discussions covering Elliptic Orbit, Rendezvous, and Orbital Transfer with BASIC programs and sample output.

Solving n Equations in n Unknowns by John Nevison

A three part text which includes review of subscripted variables and solving independent linear equations by programming in BASIC. Each part also includes student exercises.

Each Secondary School Text is available at a cost of $1.00; College Text prices are listed above. Copies can be obtained from:

Document Center
Kiewit Computation Center
Dartmouth College
Hanover, New Hampshire 03755

CMCP Series

The Department of Mathematics of the University of Denver has published a series of instructors guides and student projects in conjunction with CMCP (Computing and Mathematics Curriculum Project). These publications include:

1. collections of student assignment modules for secondary school mathematics which include teacher materials for discussion.
2. teacher versions of topics in secondary mathematics and calculus.

Each CMCP manual deals with one topic of mathematics and integrates its study with BASIC programming. The publications include sample problems and BASIC program solutions.

Topics for Secondary Math:

- Quadratic Equations
- Application of Logic to Circuit Design
- Polynomials
- Analysis of Critical Points of Polynomial Functions
- Area under a Curve, Logarithms, and Exponents
- Systems of Equations
- Lattice Points in a Circle
- Circular Functions

Topics for Calculus include:

- Introduction to the Integral
- Techniques of Numerical Integration
- Numerical Solutions to Differential Equations
- Introduction to the Derivative
- Applications of the Derivative
- Solutions by Approximation

Copies can be obtained by writing to:

Dr. Ruth I. Hoffman
CMCP
c/o Mathematics Laboratory
University of Denver
Denver, Colorado 80210

TERMINAL RENTALS

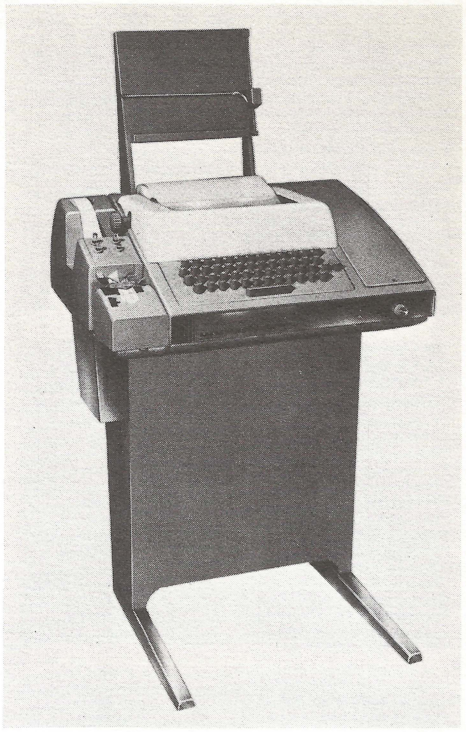
The Educational Products Group has established an arrangement with Western Union Data Services Company for rental of ASR-33 *local* and *remote* terminals for all DEC educational computer systems. This is an ideal arrangement for the customer who has enough money to purchase the basic system but is a little short for terminals. *All* DEC required features and options are incorporated in these terminals.

1. Local Terminal EDT Model 33 ASR (DSC-SCA-013). Terminates in DEC compatible Mate-N-Lock connector. Customer must provide receptacle for Mate-N-Lock and DEC Component Card (W076, W078), both included with the KL8-E interface. $60.00/month including maintenance. $65.00 installation.
2. Remote Terminal EDT Model 33 ASR—Originate Only. Includes built-in modem and acoustic coupler. $65.00/month including maintenance. $65.00 installation.

DEC or customer contact to Western Union Data Services should be through John Powers via a toll-free number: (800) 631-7050.

Affixed to each terminal is a toll-free number to call for maintenance. Service should be provided anywhere within 24 hours of the call and in most metropolitan areas sooner than that. Maintenance is included for five days a week, 8 a.m. to 5 p.m. A premium charge of $10 per terminal per month will apply to terminals located beyond a 25-mile zone of a maintenance location. There are 380 U.S. maintenance locations; phone the toll-free number above for a specific inquiry.

Especially of interest to educational institutions is the summer shutdown policy. Terminals that will not be used during June, July or August will be left in place and no rent charged, provided 30 days' written notice is given to Western Union, and that no service is requested during the inactive months.



Delivery on local, hardwired terminals is 2 to 4 weeks. On acoustically coupled terminals, delivery is 1 to 2 weeks.

Western Union is also interested in pursuing the purchase of terminals that would then be leased back to the customer, i.e., "buy in place." This can sometimes give you some "cold cash" for system add-ons in a fairly painless way. WU contact for this is also John Powers—telephone: (617) 742-9557.

IT'S A TRIPLE !!!

Wow! We've just discovered a way for you to *triple* your output...with something called

"POPULUTION"

It's new—a self-teaching BASIC workbook that teaches *three* things at the same time.

Now you can learn to use your EduSystem at the same time you're teaching yourself BASIC...AND on top of that, you'll be learning about the world population problems, too.

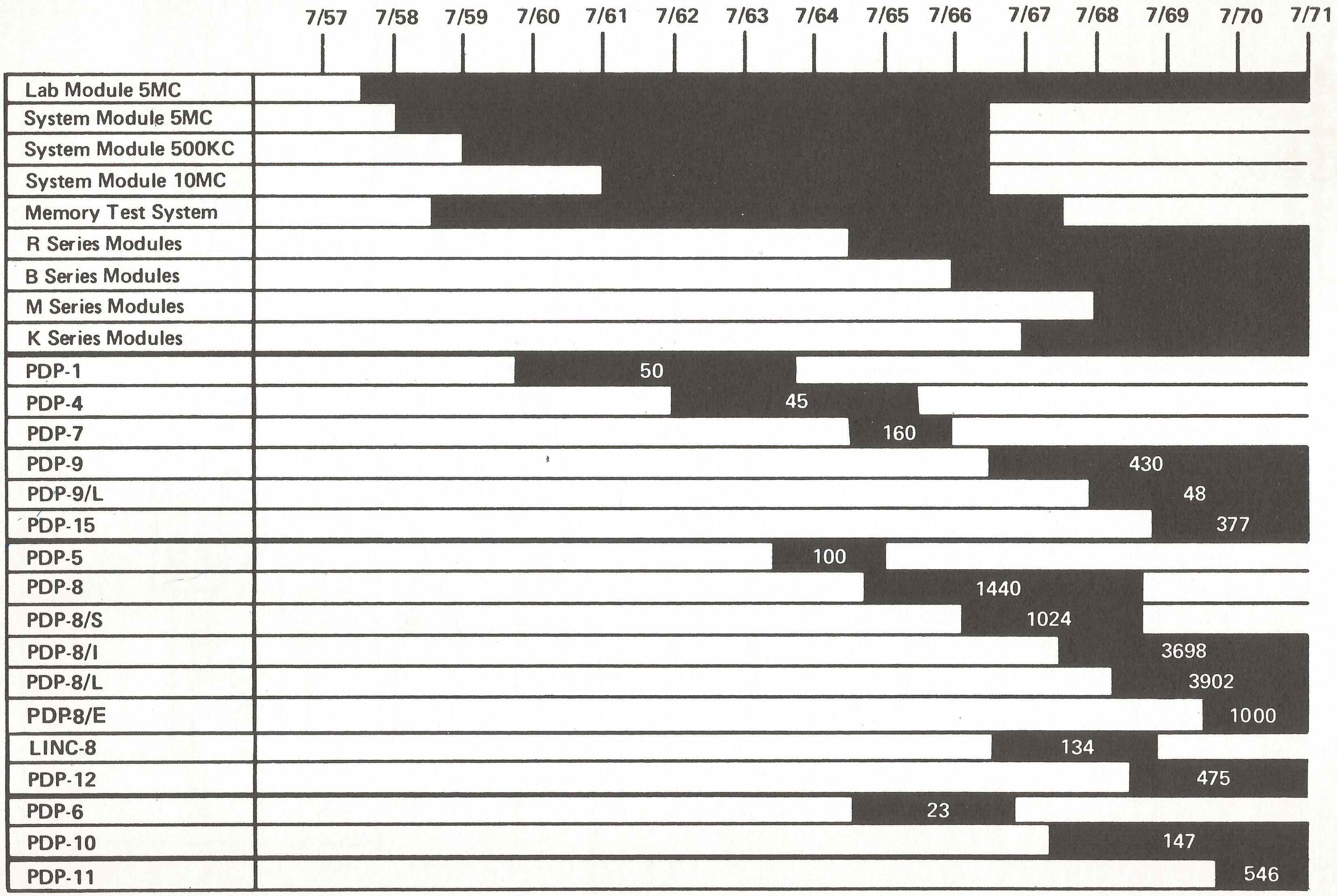
"POPULUTION" makes learning BASIC even more interesting. It's packed with fascinating text and exercises and sample problems based on population theory. Order your copy now! Only $2.00 from the Educational Products Group (5-2).

DEC PRODUCT HISTORY

Most of you Edu Readers probably are using an EduSystem every day. In your classes. In your spare time. For learning. And for fun. But you've probably never been told about the history of your EduSystem or of the many other products that DEC manufactures.

Take a look at this History Chart. The black bars indicate the period during which certain products have been made. The figures indicate the number of these products that have been installed through July, 1971. When we grow, you grow. And we're growing. That's good news for both of us!

DEC PRODUCT HISTORY



IT'S A GIVE-AWAY!

We want to give your school a KL8-EA, FREE. Yes, that's right, FREE! You can keep it. Forever. All you have to do to get it is to supply a remote port to another school for one school year.

There's more. If, within that or the following school year, that school buys or leases an EduSystem of its own ...you'll get more than a free KL8-EA...You'll get $500 toward the total value of your next order of EduSystem hardware and/or software. Pretty good deal, huh?

Let's define it a little more clearly:

1. School B (the other school) will get a free EduSystem port from you. For one school year. All they'll need to rent is:
   a. One Bell Telephone Data Set with automatic answering (Bell 103-A2). That costs $25/month.
   b. One Western Union Teletype (ASR Model 33) with acoustic coupler and paper tape reader/punch. That costs $65/month. Contact:
      John Powers
      100 Charles River Plaza
      Boston, Massachusetts
      Telephone: (800) 631-7050
   c. A telephone
   d. A $30 installation fee for School A's KL8-EA (50% off!!)
2. You (School A) will receive your KL8-EA after you submit a special form, supplied by DEC. This agreement must be signed by:
   a. Your school administrator
   b. School B's administrator
   c. The Western Union and Bell Telephone representatives (testifying that they have been contacted by School B for the aforementioned equipment.)
3. This is what the configuration will look like:

COMPUTER CLUBS

If you haven't already started one, here's your chance to organize a computer club at your school.

Hot off the press is "THE COMPUTER CLUB INFORMATION KIT FOR SCHOOLS" by Marion Vande Wall. It's a handbook that provides suggestions, materials and encouragement to high schools who want to give students an opportunity to explore computer science. It talks about activities, responsibilities of the sponsor, gives practice problems, proposed club constitutions and other goodies.

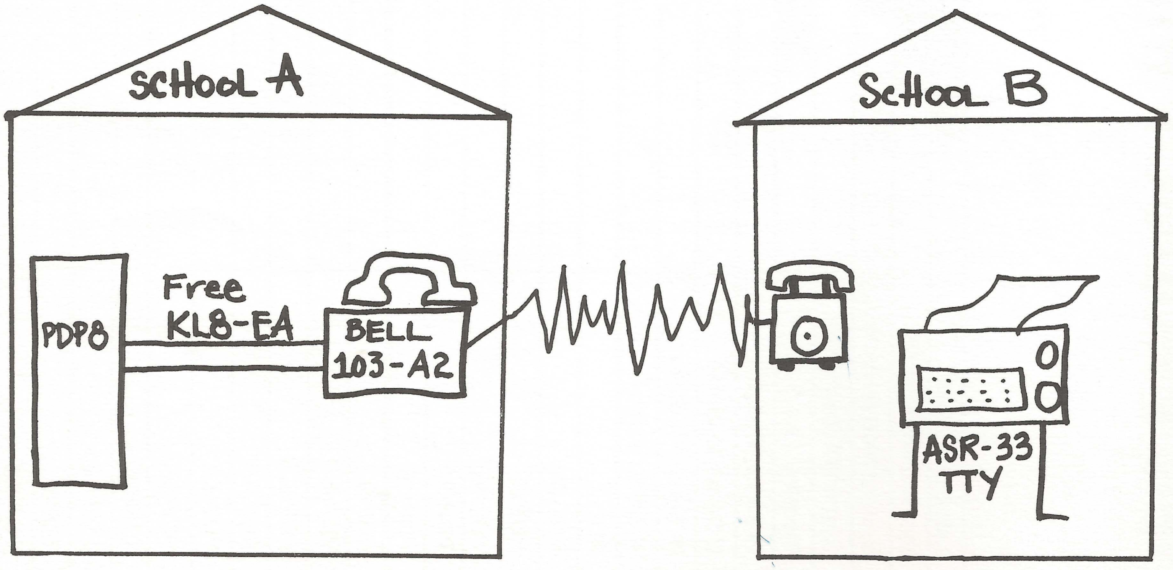
It's available for $1.00 from the Association of Educational Data Systems, 1201—16th Street N.W., Washington, D.C. 20036.

HICKOK

Hickok Teaching Systems, Inc. is a subsidiary of one of the world's largest manufacturers of electronic test equipment. Hickok has provided and continues to provide schools and colleges with broad educational programs including training equipment and instructional aids for electronics, metalworking, automotive technology and a broad spectrum of technical subjects.

Now, for vocational schools, technical schools and community colleges, Hickok has added to its line of products, DEC educational computer systems. Vo-Tech schools now have a single source for all of their equipment and curriculum material—from circuit design through sophisticated programming and data processing systems.

Hickok Teaching Systems, Inc.
Wheeling Road
Woburn, Massachusetts



That's it...that's all there is to it.

School A...the KL8-EA is yours to keep. And *maybe* you'll get $500 worth of EduSystem, too!!

School B gets the power of a single-user EduSystem for a year, at an unbeatable price!

X-RATED

X stands for excellent!

Imagine learning BASIC at the movies! Available now for your school is an instructional system that provides a unique blend of films and course guides for learning BASIC programming. Lessons are contained on 16 mm. film or 8 mm. cassettes; the films are supplemented with viewer's guides and programmed instruction workbooks that aid the student in applying the programming concepts.

This BASIC package has been developed by Edutronics Systems International, Inc. They offer more than BASIC, too. All their courses are modular so that you can tailor the course to your needs by choosing only the appropriate segments. For more information, write to:

EDUTRONICS
Lakeside
3345 Wilshire Boulevard
Los Angeles, California 90070

Another approach to teaching BASIC incorporates a visual aids package of overhead transparencies. The package includes *23 mounted transparencies* designed for use with an overhead projector. It also includes a *teacher's guide* which provides step-by-step guidelines for teaching a beginning BASIC programming course.

Learning BASIC via Overhead Transparencies is an ideal way to start all your students on the way to effective use of your EduSystem.

The package is ideal for the new teacher, just starting out with the EduSystem himself (or herself). It's perfect for the experienced teacher who wants to add some pizz-azz to his current BASIC course. And it can even be used effectively by students to teach each other.

Order your set today for $50.00 from the Educational Products Group (5-2), Digital Equipment Corp., Maynard, Mass. 01754.

COMPUTERS ARE OLD STUFF!

Computers aren't new anymore.

But lots of people still don't see it that way.

Computers aren't revolutionary—they're used in schools all over the country.

If you believe that you (or your school) need a computer to teach more effectively...

If you are already convinced, but others aren't so sure...

How about getting your hands on a Convincer Kit?

Hundreds of teachers, administrators, and school board members have bought them to help get EduSystems into their schools. The Convincer Kit is a collection of brochures, essays, ideas and arguments(?). And many of the elements of the kit can be used after you get your EduSystem, too.

It includes:

Presentation Materials

- Presentation Guidelines and Overhead Projector Transparencies (for convincing)
- Common Questions and Answers about Educational Computers.

Curriculum Materials

- Teach Yourself BASIC I
- BASIC Application Programs
- Problems for Computer Mathematics
- Educational Program Index

Software and Manuals

- BASIC Demonstration Programs and Tape
- EduSystem 10 User's Guide
- Introduction to Programming Handbook
- Programming Languages Handbook

The kit costs $15.00—far less than the actual value! And it includes Discount and Bonus Certificates, too!

Fill out this form and order your Convincer Kit today. There's still time to get your EduSystem for the next school year!!

SEND TO: Educational Products Group (5-2), DEC, Maynard, Mass. 01754

☐ Enclosed is $15.00. SEND A "CONVINCER KIT"

Name ______________________ Title ______________________

School ______________________ Dept. ______________________

Address ____

City ______________ State ______________ Zip __________

MORE SIMULATIONS

As you probably know, we have already published a wealth of simulation programs for use in many subject areas. These programs were developed by the Huntington Project on an EduSystem 50 (so you *know* they'll run!) BASIC SIMULATION PROGRAMS include:

Vol. I and II: Biology, Earth Science, Chemistry
Vol. III and IV: Mathematics, Physics
Vol. V and VI: Social Studies, Teacher Assistance

All six volumes can be obtained from the Educational Products Group (5-2) for $10.00.

And now there are *more simulations.* They've just arrived. All six new programs are terrific additions to the existing volumes. They include:

1. **LOCKEY:** An Enzyme Study
   - studies the lock and key model for enzyme action.

   Subject Area: Biology

   Level: Grades 10–12

   Materials: Student Materials (Instructions for use and analysis)
   Teacher Manual
   Resource Handbook (Background Information, Sample Runs, Listings, and Student Projects)
2. **GENE1:** A Simulation of the Inheritance of Genetic Traits.
   - a simulation of the inheritance of genetic traits for a varying number of offspring. Demonstrates the statistical value of the Mendelian Laws.

   Subject Area: Biology, Math

   Level: Grades 11, 12

   Materials: Manual (Discussion questions, Instructions for Use, Sample Runs and Listing).
3. **POLSYS:** Public Policy Making
   - a political system which allows the student to discover how local government operates.

   Subject Areas: Government, Social Studies

   Level: Grades 7–12

   Materials: Student Manual (Instructions for use and Sample Runs)
   Teacher Manual
   Resource Handbook (Models, Sample Roles and Listings)
   Group Strategy Sheet
4. **STERL1 and STERL2:** The Sterile-Male Technique in Insect Control
   - investigates the effectiveness of two different methods of pest control.
     1. Use of pesticides
     2. Release of sterile males, whether used singly or in an integrated program.

   Subject Areas: Biology, Environmental Studies

   Level: Grades 9–12

   Materials: Teacher Material (Sample Runs, Instructions for Use, Suggested Discussion Questions)
   Resource Handbook (Suggestions for Use, Background Information, Sample Runs, Program Listings, References)
   "Scientific American" Reprint, "The Eradication of the Screw-Worm Fly," by Edward F. Knipling.
5. **POLUT:** Water Pollution
   - the interaction between water and waste provides the context with which the user controls specific variables which affect the quality of a water resource.

   Subject Area: Biology

   Level: Grades 10–12

   Materials: Teacher Support Material (Description, Goals, Discussion Section)
   Resource Handbook (Background Information, Sample Runs, Listings)
   Computer Lab Guide
6. **CHARGE:** Millikan's Oil Drop Experiment
   - this simulation of a modern version of the Millikan Oil Drop Experiment is designed to demonstrate to the student the existence of a discrete unit of electrical charge.

   Subject Area: Physics

   Level: Grades 11 or 12

   Materials: Teacher Material (Instructions for Use, Discussion Questions, Goals)
   Appendices (History of Experiment, Program Listings, Sample Runs)
   Laboratory Explanation

The paper tapes and documentation for these new programs are available from:

HUNTINGTON II
c/o Professor Ludwig Braun
Polytechnic Institute of Brooklyn
333 Jay Street
Brooklyn, New York 11201

JOIN

Did you know that DEC has a Special Interest Group (SIG) in Education?

Our first meeting will be held during the spring DECUS meeting in Boston, May 11–13, 1972. Everyone's invited to join, whether you're an EduSystem user or not. And even if you can't come to Boston for our first formal get-together, we'll keep you up to date on what happens there!

Just fill out this convenient form. Give us your ideas about what you'd like to talk about, too!

DIGITAL EQUIPMENT CORPORATION
SPECIAL INTEREST GROUP IN EDUCATION
MEMBERSHIP FORM

☐ I would like to become a member of DEC's SIG in Education.

☐ I plan to attend the DECUS spring meeting in Boston, May 11–13, 1972.

☐ I won't be attending, but send me a copy of the proceedings.

A. ☐ DEC User ☐ Other Mfgr.______ ☐ Time Sharing Service ☐ No Computer

CPU __________ Local Terminals __________
Memory __________ Remote Ports __________
Disk(s) __________ Special Equipment __________
DECtape __________

B. Computer Usage:

☐ Math ☐ Science ☐ Business ☐ Humanities
☐ Computer Science ☐ Administration
☐ Engineering—Type__________ ☐ OTHER ________________

C. ☐ BASIC ☐ FOCAL ☐ FORTRAN ☐ ASSEMBLY ☐ OTHER ________

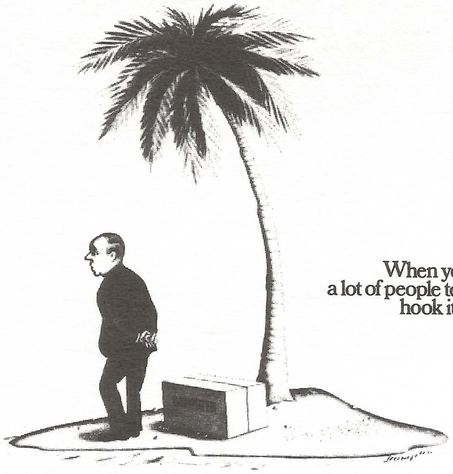
D. ☐ Grade School ☐ Community College
☐ Public Secondary School ☐ Junior College
☐ Private Secondary School ☐ Four-year College
☐ Vo-Tech School ☐ University________________
☐ OTHER ______________________________

E. I would like to see the following discussed at the SIG meeting:

☐ New Products
☐ New Applications
☐ OTHER ______________________________
____

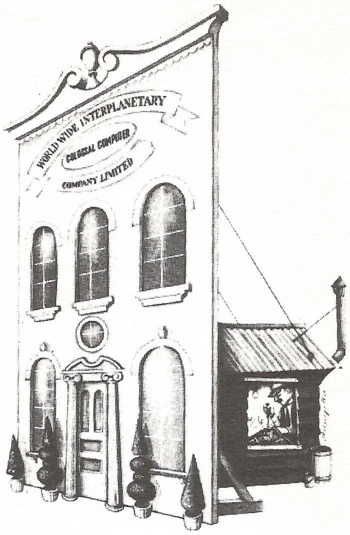
F. Comments: ______________________________
____
____

G. NAME____________________ TITLE____________
SCHOOL____________________ DEPT ____________
ADDRESS ______________________________
CITY________________ STATE__________ ZIP__________

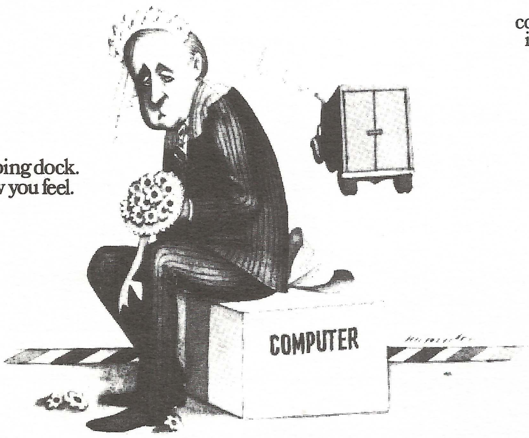


When you buy a computer you get
a lot of people to talk to. When it comes time to
hook it up, you got a problem.

•• **Fold Here** •••••••••••••• ••••••••



The reason most small computer
companies can't give you big computer support
is because they're small computer companies.



Your new computer's on your shipping dock.
If it's not one of ours, we know how you feel.

•••••••••••••••••••••••••••••••••••• **Do Not Tear - Fold Here and Staple** ••••••••••••••••••••••••••••••••••••

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